

CLAIMS

1. In vivo diagnostic or therapy micro-device comprising:

- a substantially longitudinal body having a quadrilateral-shaped section, provided with at least  
5 one main canal (24) in the direction of its length, one input (18) of which is located at a first end (14) of the body,

- and several secondary canals (26, 28) connected to at least one main canal (24) and opening  
10 up sideways by lateral outputs (22, 222, 322, 422).

2. Micro-device according to claim 1, further comprising:

- one or more electrodes (10) arranged on  
15 an outside portion of the body,

- one or more electrical connection pins (16) located at the first end (14) of the body close to the input (18) to the said canal.

20 3. In vivo diagnostic or therapy micro-device comprising:

- a substantially longitudinal body with a quadrilateral-shaped section, provided with at least one main canal (24) in the direction of its length, one  
25 input (18) of which is located at a first end (14) of the body,

- one or more electrodes (10) located on an outside portion of the body,

- one or more electrical connection pins (16) located at the first end (14) of the body, close to the input (18) to said canal.

5                   4. Micro-device according to either claim 2 or 3, the electrical connection pins comprising micro-cavities made in the body of the micro-device.

10                   5. Micro-device according to claim 4, the micro-cavities having a height and width between 10  $\mu\text{m}$  and 50  $\mu\text{m}$ .

15                   6. Micro-device according to one of claims 1 to 5, comprising at least two parallel main canals.

7. Micro-device according to one of claims 1 to 6, at least one of the main canals opening up to a second end (20) of the body, called the distal end.

20                   8. Micro-device according to one of claims 1 to 7, comprising a second bevel-shaped end (20).

25                   9. Micro-device according to one of claims 1 to 8, the maximum dimension of the section of the body being less than 1 mm.

30                   10. Micro-device according to one of claims 1 to 9, the body having a square or rectangular section in which each side has a maximum dimension of less than 300  $\mu\text{m}$ .

11. Micro-device according to one of claims 1 to 10, the body having a square or rectangular section in which each side has a maximum dimension of less than 900  $\mu\text{m}$ .

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12. Micro-device according to one of claims 1 to 11, the longitudinal extension of the body being between 0.5 cm and 3 cm.

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13. Micro-device according to one of claims 1 to 12, the body having two parallel opposite surface areas (12, 13) between the first and the second ends (14, 20).

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14. Micro-device according to one of claims 1 to 13, the inlet (18, 218, 219, 318 - 320) into at least one main canal (24) being funnel-shaped.

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15. Micro-device according to one of claims 1 to 14, the body of the device being made of silicon.

16. Micro-device according to one of claims 1 to 15, further comprising a wave guide (221).

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17. Process for manufacturing an in-vivo diagnostic or therapy micro-device from silicium comprising:

- the manufacture of two substantially longitudinal portions of the device, each portion comprising at least half a canal extending along a longitudinal direction of the micro-device (24), or a

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first portion comprising a canal extending along the longitudinal direction of the micro-device,

- assembly of the two portions, directly to each other or with an intermediate layer (256, 456), so as to form at least one so-called main canal extending along the longitudinal direction.

18. Process according to claim 17, further comprising the production of one or more electrodes (10, 62, 162) and one or more electrical connection pins (16, 53, 153, 162, 164) on at least one of the two portions.

19. Process according to claim 18, the electrode(s) and the connection pin(s) being obtained by etching or by deposition of biocompatible metal (62).

20. Process according to one of claims 17 to 19, each of the portions being made in a silicon surface layer of an SOI substrate.

21. Process according to one of claims 17 to 20, comprising an intermediate layer (456) itself being provided with a fluidic canal (418).

22. Process according to one of claims 17 to 21, further comprising the manufacture of at least one secondary canal portion, connecting to the half-canal or the main canal, the assembly of the two

portions of the body forming at least one secondary canal connecting to the main canal.

23. Process according to one of claims 17  
5 to 22, further comprising a step for making an optical guide (221).